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Compressed Air Can Do Anything

It Will Paint Your House, Smash Your Baggage or Shampoo Your Head—Rings Cathedral Chimes—Finest Set of Bells in World Useless For Years Until Compressed Air Used to Ring It—This Power Indispensable to Railways.

We are all familiar with the uses of compressed air in bicycle tires, in door brakes, in pneumatic mattresses, and in the department store cash tube system, to mention a few modern applications, which, however, are novel no longer.

But do we know that baskets are now made by compressed air, that statuary is chiseled by it, that carpets and furniture is cleaned and dusted by it, that buildings are painted by it, and that a modern train service would be out of the question were it not for the practical efficiency of air under pressure?

Outside of the engineering world how many people imagine the scope and the multitudinous uses of air, tools and machinery in the building of bridges, in the carving out of tunnels, in almost every branch of mining, in ship building, etc.?

Riding on a modern, thoroughly equipped railroad, did it ever occur to you that the train is signaled, and braked, and steered by air? That the carpets, the cushions, and the furniture of the coaches are cleaned and dusted by pneumatic brushes; that the cars are painted by pneumatic paint spraying machines, and ventilated by air; and, to mention the very latest appliances, that the baggage is handled by air elevators, the bell chimed by a pneumatic ringer?

After eighteen years of costly and extensive experimenting the pneumatic interlocking signal and switch system has been made a success and a fixture at the leading terminal stations in this country. By its aid one man now does the work that would otherwise require the combined efforts of six operators, and he does the work better, the chances for his making mistakes having been reduced to a minimum. With the lever in his hand he controls the marvelously efficient interlocking machine, which in turn controls a number of switches and signals connected by pneumatic cylinders. As many as a dozen trains may be rushing down on the signal house, one movement of his hand—and he has signaled them all—another movement—and he has steered each individual train across a switch, launching it on its proper course. The system in use at the Boston Southern station is the largest known. There are no less than 228 pneumatic switches in operation, eleven trains may move simultaneously into or out of the train shed, 148 semaphore signals are provided for the 400 possible routes presented in the switch system of that terminal.

Air Instead of Brooms.

Cleaning car cushions and carpets by compressed air has lately been introduced at the Royal Blue Line station, Jersey City, and other railroads. A pipe flattened at the end until it is almost the shape of a spade, is used.

COMPRESSED AIR AUGUR USED IN CAR BUILDING.

The air rushes through perforations at the thin, wide end with incessant force, cleaning the material without touching it, at a much swifter rate, and much more thoroughly than ordinary brooms or brushes could. Besides, the wear and tear consequent on beating the material is done away with, which is, of itself, a great saving. Armed with a single pneumatic cleaner, one man can do more work in less time than three men could formerly do with canes and brushes. As for painting cars, the pneumatic paint spraying machines now in the market are even superior to those used in painting the World's fair buildings in Chicago in 1893. Everyone remembers the wonderful results accomplished at that time. Now a painting machine has been invented that will coat over 46,000 square feet of surface inside six hours and a half in the hands of a skillful operator. Painting by air is not only immeasurably swifter and cheaper than old-fashioned brush work, but it has been demonstrated that paint supplied by the air machine is applied more thoroughly and is more durable than brush painting. The Pittsburg & Lake Erie railroad, the Louisville & Nashville railroad, and the Illinois Central railroad were pioneers in this field. The latter road is at present repainting about 400 cars per week with compressed air, while the Louisville & Nashville railroad recently covered eighty-five buildings under this method in record breaking time.

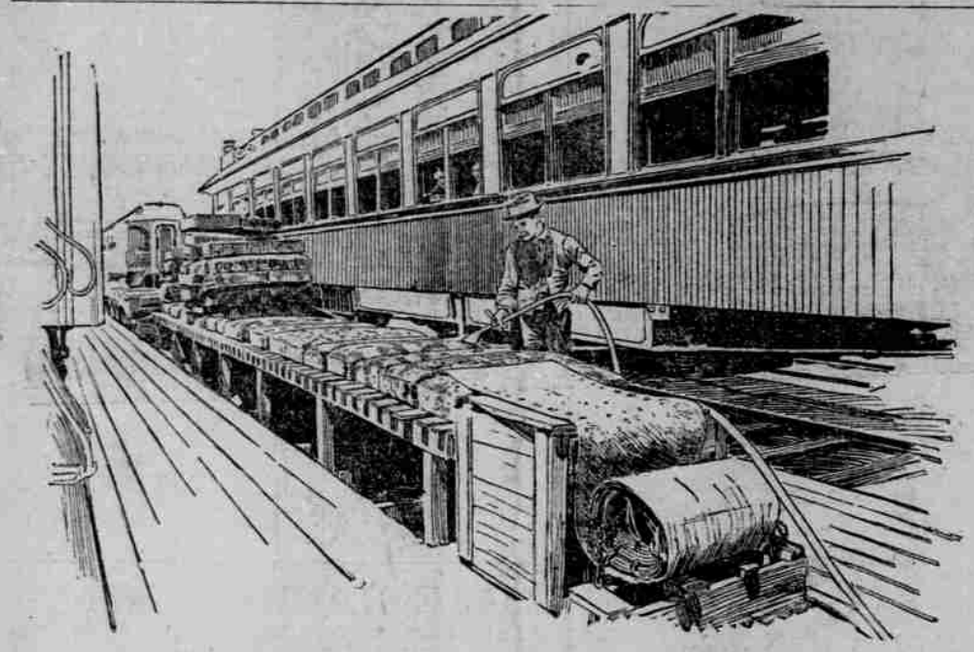
Handling Baggage With Air.

The Grand Rapids & Indiana railroad has gone one step further by lately adopting the pneumatic "baggage handler" system. This device has proved itself able to handle heavy baggage much more rapidly than it could otherwise be handled, and, moreover, to do away with breakage. The day of the baggage smasher may, therefore, be past. The machine is a very simple arrangement of air cylinder and baggage support. The latter is lowered to the platform, where it receives the baggage. Then it rises quickly and is automatically swung around by a cam action, carrying the baggage into the car. The lift is operated by air drawn from the train tanks to a special reservoir, and it is controlled by the baggageman through suitable cocks on the inside of the car. The machine has a lifting capacity of 500 pounds, with seventy pounds of air pressure; it has a spring scale device providing for the weighing of the baggage as it is handled, and it is able to load trunks at the rate of six pieces every thirty-five seconds. For country stations, where now there is only one man to handle baggage, with the usual disastrous results, this device will save many a trunk from being damaged or smashed.

If you wish to hear locomotive bells rung by compressed air you must take a train on the Kansas City, St. Joseph & Council Bluffs railway, on which line a number of pneumatic bell ringers are in operation, giving admirable results.

Why We Build Bridges Quickly.

It would simply be impossible to do the high class work of modern bridge building construction without the aid of air tools. All the world pricked up its "multitudinous ears" when the success of American builders in raising thoroughly finished bridges in Africa within a hitherto unapproached time limit was established beyond a doubt. The press was very busy and patriotic on the subject, but forgot entirely to state the reason why the superior



CLEANING CAR CUSHIONS AND CARPET BY COMPRESSED AIR.

compressed air methods and machinery here mentioned would not now be available in practical form.

It might bore the lay reader to describe the new air tight system for pumping artesian wells, the hundred-and-one handy little inventions, such as pneumatic track sanders for locomotives, sand blasting machines for removing the scale from metals of all kinds, coal cutters, etc. But there are a few things in the way of "air novelties" which are most interesting.

Take the work of basket making. Surely no one ever heard of any of the old machines turning out 180 bushel baskets per hour, or 1,800 baskets per day, but a compressed air basket making machine is now doing it at the Michigan basket factory, Traverse City, Mich. The staves of the baskets are fastened to the hoops by staples of wire taken from the coil, joined and driven by the machine. The staves radiate from a center in a disc-like shape. To bend them into the lines of the basket form, four processes or movements are made by the machine all of which are automatic and obtained by the medium of compressed air. The whole combination is very simple. The air is not cooled, and the machine runs ten hours every working day.

Painting Pictures With Air.

Then there is the fountain air brush, which some claim will soon be adopted by the leading artists for applying color on canvas. It is shaped like and is but little larger than a lead pencil, is handled in the same manner, applies color in large quantities in a short time, and is yet adjustable for the finest line ever drawn on canvas by a gifted artist.

Pneumatic Mail Service.

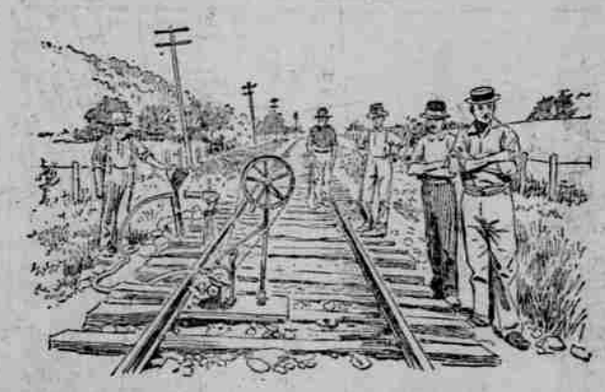
The pneumatic mail tube dispatch system is familiar to most readers, but the fact that previous to 1894 it was practically unknown in this country, and that since then we have made swifter strides in that field than Europe, may not be generally known. Five years ago when John Wanamaker as postmaster general opened the first pneumatic mail tube line, extending from the postoffice to the house in Philadelphia, the start was made in entirely new lines. While to this day in Europe they are using little two and three-inch tubes for telegrams only, we began at the outset by constructing six-inch tubes, and use them to transport mail in large quantities. Tubes had never been used successfully for the transmission of ordinary mail matter before.

The mail tube industry has now developed so fast in this country that even eight-inch tubes, with cartridges carrying 600 letters, are in successful operation in our big cities. The longest circuit ever built in the world is the main line recently laid in New York City extending from the terminal postoffice, a distance of three and one-half miles. This is an eight-inch tube circuit, the cartridges travel at tremendous speed, the time of transit consumed in dispatching in either direction being only seven minutes. Another big circuit has been laid across the Brooklyn bridge, so that you may have the pleasure of knowing that while you are speeding over the bridge in the cars, your mail may be making better time ahead of you shooting away in the cartridge inside the big tube like an eight-inch projectile from a modern breech-loader. A total of seventeen miles of eight-inch tubes have been laid underground in this country since Aug. 1, 1898, which shows the rapid increase of the system.

A method of sweeping and cleaning railroad depots by compressed air blowers has been instituted by the Central railroad of New Jersey. It has been found there that sweeping and scrubbing and cleaning can be done far more effectually with air than in any other way. Gangs of men furnished with compressed air blowers are turned loose after working hours upon the floors of the various buildings. They go over every square inch of surface, and over the walls and the furniture with their blowers, which sweep every speck of dust and dirt before them, doing the work much better than double the help could do with brooms. The railroad hands have found many unique uses for the compressed air, which is so handy for them. They find that it will clean clothes and fine fabrics as well as plush seats and carpets, and dozens of them take their clothes and uniforms to the men who handle the compressed air, to be cleaned. The work takes but a few seconds, is done thoroughly, and has the advantage of costing nothing. The men have also found another and still more unique use for the air.

"I never pay for a shampoo any more," is a common saying around the yards now. "I can get the best shampoo to be had right here for nothing. How? d'ye say—why—compressed air!"

JOHANNES HROLF WISBY.



TAMPING RAILROAD TIES BY COMPRESSED AIR.

of the die. The hammer is light and powerful. For small rivets it can be held in the hand, but for heavier work it is supplied with a yoke support, and thus fitted it will drive and fit the largest size rivets in use, which are generally one inch in diameter. Probably the hardest manual labor in ship and bridge building is that of riveting. Combined with this is an amount of technical skill acquired only by long and arduous apprenticeship, and varying with the class of rivets driven. In addition the necessity for heavier plating, doublings, etc., requires the use of larger and longer rivets, which cannot be properly chased down by hand. The pneumatic hammer is the practical device which has enabled builders to surmount these and other obstacles. This air tool also saves money. Thus while 9,255¾ rivets were driven at an average cost of 8.57 cents apiece, 151,167 rivets were driven by air hammers at an average of only 2.06 cents apiece. In fact, it will not be exaggerating the conditions to state that were it not for the various types of pneumatic implements our builders would not have been able to produce the bridges ordered abroad within the time limit, not to mention the quality of the work. The same measure applies to ship and engine building.

Air Rings Cathedral Chimes.

New York may know that in the chimes of St. Patrick's cathedral on Fifth avenue the city possesses one of the finest orchestras of this kind in the world, but does New York know that these bells are now rung by compressed air? Nineteen bells, the heaviest of which weighs about 6,000 pounds, the lightest about 300 pounds, constitute the set, which has been placed in the northern spire, 180 feet above ground. The perplexing question of how to ring these bells satisfactorily arose as soon as they were received from France. A committee of church fathers, headed by Archbishop Corrigan, examined the various systems of chime ringing exhaustively, but the crudeness of methods, expense of installation and the necessity of having expert attendants caused the known systems to be rejected. After looking about everywhere the committee finally accepted a system consisting of compressed air and electricity, one being the motive power causing the bells to ring, the other being employed as the means of operating the mechanism which strikes the bells. Chime bell ringing by compressed air had never been tried before and the ingenuity of the inventor, Hartford C. Champ of New York, was severely taxed to complete a system which is undoubtedly the most advanced ever used for this purpose. The keyboard of the chimes is in the sacristy of the church. The operator presses a key on the board corresponding to the bell that he desires to sound. This establishes an electric connection, which serves to open a valve in the steeple admitting compressed air to a piston connected with a clapper, which strikes the bell. Electricity is the trigger, and compressed air the power in this operation. The largest orchestral chime in the world is that of the cathedral of St. Germain-L'Auxerrois in Paris, which set was finished in 1878. Their construction consumed fifteen years, but they never rang successfully until last year. There are forty-four bells in the set, which, it is said, will be operated by compressed air next year to welcome visitors to the Paris world's exposition.

It should be remarked that were it not for the inventive enterprise of Mr. Sergeant of the Ingersoll-Sergeant Drill company of New York most of the

A Cuban Tragedy.

(New York Press.)

Not a great way from Cardenas, Cuba, in the hamlet of Guadalupe, occurred one of the saddest tragedies of the Cuban war. The village was crowded with starving reconcentrados, of whom more than 3,000 had died in the streets within three months. A wealthy Englishwoman, then in Cardenas, answering the appeal of the priest, accompanied by her beautiful young daughter just out of school, went to Guadalupe with seven oxloads of provisions, clothing and medicines, which she had bought with her own funds for the starving. The two women, with their servants, personally superintended the distribution, which occupied two days, and they promised to return at once to Cardenas and bring another supply. On the night before the good Samaritans were to leave, the Spanish officers gave a banquet to them. The house was draped with flags and illuminated in honor of the women, and the decorations proved their undoing.

The lights attracted the attention of the insurgents on the hilltops, and with the first course of the dinner came a fusillade of musketry, in which mother and daughter and several Spanish officers were killed. Whether the patriots knew that their benefactors, who had come to save their wives and little ones from perishing of hunger, were inside, none can say. At any rate, the Cuban troop that did the bloody deed was captured next day and shot to a man.

Incidents of Life in the Transvaal.

Boer Habits as They Appeared to a Man Who Spent Years in South Africa—Illiteracy, Hostility to Foreigners and Belief in God's Favor the Most Marked Characteristics of the Boer.

The myriad-minded, immortal Shakespeare makes Portia say:

"The quality of mercy is not strained,
It is twice blessed;
It blesseth him that gives and him that takes;
'Tis mightiest in the mightiest, it becomes
The throned monarch better than his crown."

It is just within the bounds of possibility that the Right Hon. William Ewart Gladstone may have had this somewhat hackneyed passage in his mind when he decided to give the Transvaal back to the Boers in 1881, after England had sustained an ignominious defeat at the hands of the Boers. It is just possible, I say, that Shakespeare was Mr. Gladstone's authority for the act; if so, he should have remembered that the "Sweet Swan of Avon" had also said:

"Mercy is not itself, that oft looks so,
Pardon is still the nurse of second woe."

The events now transpiring in South Africa fully exemplify the wisdom of the latter quotation.

Another item overlooked by Mr. Gladstone in his magnanimous experiment is that in order to make mercy bless both given and receiver, it is indispensable that both the interested parties should be on the same intellectual plane; that, in point of fact, the receiver should be mentally capable of discriminating between generous forbearance and arrant cowardice; otherwise the act of mercy will waste its sweetness on the desert air as it most emphatically has done in this Transvaal instance.

Recently I read in a dispatch that Mr. Paul Kruger had stated to an interviewer that by far the most chivalrous action England had done during the present century was giving the Transvaal to the Boers after the battle of Majuba. This statement is in conformity with the hypocrisy displayed by Oom Paul during the past eighteen years. Whether he was speaking from conviction or not, he is equally guilty of willful deception. If he didn't think so, the jugglery is self-apparent; if he did think so, then all his teachings and preachings to the illiterate Boers, since Majuba day, have been sanctimonious humbug.

Full of Boastfulness.

Leaving Mr. Kruger alone for the moment, let us ascertain how far the average Transvaal Boer was impressed by England's foolish act in leaving him unwhipped. A few specimens of the Boer's intellectual capacity will suffice. Shortly after peace had been declared between Great Britain and the Transvaal, a Boer, in discussing the war with an Englishman, declared that his people had acted with great leniency towards England, seeing that, after demolishing the English army, they had refrained from marching on with their wagons and capturing England itself. The Englishman sarcastically inquired how the Boers expected to cross the intervening body of water, to which the Dutchman replied that you could safely "leave a Boer alone to find a ford somewhere." Finding fords in the South African rivers is something a Boer is expert at; therefore, there was no reason why he could not ford the river between England and Africa. Another instance: It will readily be understood that the war of 1881 was a topic an Englishman scarcely cared to discuss with a Boer in the Transvaal, but on one occasion a Boer provoked me into replying to his parrot-like chatter. This particular Boer was so persistent in gloating over the English defeat that I asked him if he really thought the Boers had beaten the whole English army. He replied that they had whipped all they could see, and if England had any more men why didn't she trot them out? To this I answered that had England seen fit she could have placed 100 men in the field to every Boer the Transvaal could raise. I don't think the Dutchman believed me for a moment, but he shouted, with angry demonstrations, that even if England had sent 1,000 men against every Boer, the latter would still have won, because the Lord was on his side.

An Intelligent Boer.

One more instance: I was one day riding over a Boer's farm in the Transvaal and was passing a flock of sheep, when I was joined by the insufficiently washed and liberally bewhiskered owner of the ranch. We rode along together, discussing sheep and kindred subjects, and, amongst others, the following conversation ensued:

Boer (meditatively)—Now, I wonder what is done with all the wool the shopkeepers buy from us?

Myself—What do you think becomes of it?

B.—Well, I don't know; they say it is made into the blankets we buy.

M.—Do you believe that?

B. (positively)—No. It stands to reason that it is not true. How can they make such long blankets from such short wool?

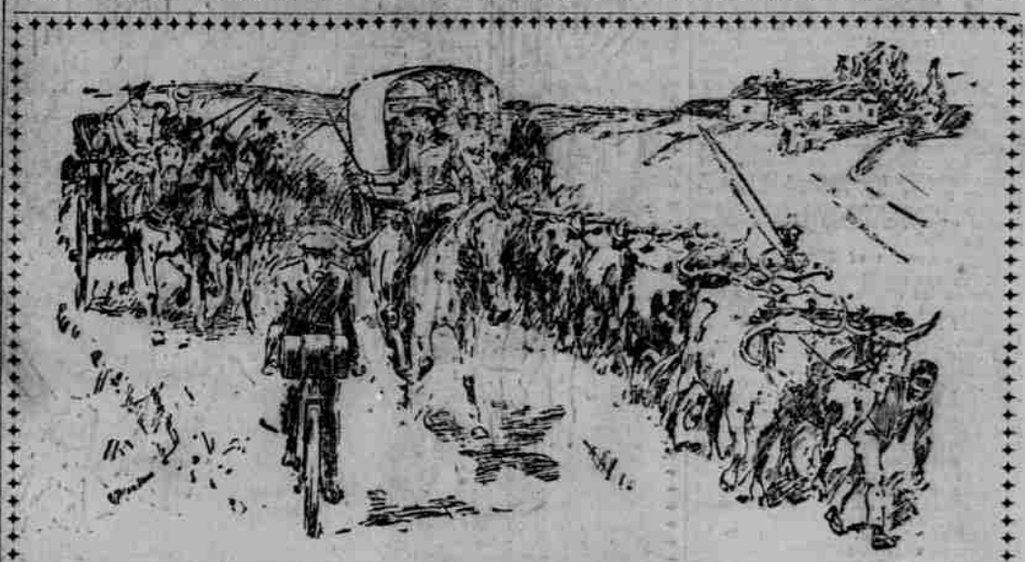
It may, perhaps, be objected that such instances of colossal ignorance can be found in other countries besides the Transvaal; that even in fair Utah it is possible, by searching diligently, to find an occasional individual who is not an intellectual Croesus. True. The difference is, though, that amongst the Anglo-Saxons such self-complacent, benighted, intolerant stupidity is the exception, while among the Transvaal Boers it is the rule.

Now, these are the people to whom Gladstone, then premier of England, gave back the Transvaal in 1881, without the slightest effort to efface the sting of defeat. Gladstone undoubtedly considered England so great and powerful that she could well afford to ignore the sneers of any other nation, caused by this mode of procedure; but I don't think it possible that Gladstone could have imagined that any Boer would think the act as an evidence of utter and hopeless English defeat. Standing on the lofty eminence of his giant intellect, he failed to comprehend the narrow-minded, small-souled, insignificant nature of the pigmy Boer. And that is where Mr. Gladstone made a grievous mistake, a mistake for which England is today suffering.

Are All Incompetent.

After regaining their country, the Boers were in considerable better position than before the English occupation. Capital had been brought into the country by English merchants and speculators and these individuals had, generally speaking, to remain in the Transvaal for protection of their interests. In spite of this, the same old tale was repeated. Boer mismanagement and indolence again tangled the industrial skein and the Transvaal's cash box had a painfully hollow sound, when the gold discoveries of 1886 caused the rush of foreigners into the country.

At first there was no question of alien rights or wrongs. Like all new mining countries there was considerable inconvenience, in the way of postal service, etc., to put up with, but the grumbling was mostly good-humored. Everyone was occupied making money or dreaming of making it, and it was generally thought that when matters had simmered down, everything would arrange itself satisfactorily. As far as any agitation for foreign intervention or any sign of Uitlanders usurping power is concerned, I can say, emphatically, there was none. The suspicion of this came first from the Boer government and was, at the time it was originally bruited about, without foundation. From the very first, the honorable members of the Transvaal volksraad seemed excessively sensitive to the fact that the Uitlanders were their superiors in intelligence and progressiveness. Instead of endeavoring to co-operate with these Uitlanders in developing the resources of the country the Boers profess to love so much, the only remedy that appeared to suggest itself to the limited faculties of these patriotic legislators was to tax to the utmost the products consumed by the aliens and at the same time debar the stranger from having a voice in such taxation. The idea seemed to be: "This cursed adventurer will not be able to stand that kind of thing very long, let us skin him while we have a chance." But the cursed adventurer did stay and the Boer authorities, while avariciously grasping the money extorted in this manner from the Uitlanders, lost no opportunity to insult him. This was the fruit of England's leniency. The Boers despised the English, because they firmly believed they had whipped them, and as most of the Uitlanders were English, the members of the volksraad felt it incumbent on them to degrade them on every favorable occasion.



The Flight From the Transvaal—British Residents on the Road to British Territory.

When the Transvaal crisis assumed such a serious aspect, the British residents hurriedly quit the country for British territory. In one fortnight the relief committee at Johannesburg assisted 2,500 destitute women and children to reach their friends. The British subjects residing in out-of-the-way places also made all possible efforts to leave the country quickly, and oxen, wagons and carts may constantly be seen conveying families and furniture toward the border.

Tax Unjustly Laid.

As to taxation. The foreign population had to live on canned goods to a great extent, for there was little else to be had. Certainly there was the tough meat and the coarse wheaten meal sold by the Boers, but anything a fastidious man was accustomed to was not manufactured in the country. The Boer had sufficient plain food for his own use on his farm and never used the imported luxuries, except on rare occasions or when he could get someone else to stand the expense. Everything the foreigner used was immediately taxed exorbitantly. All canned meats, fish, fruit, preserves and biscuits were taxed 25 cents per pound; cigars (which the Boer doesn't use) were taxed 12 cents each; imported tobacco (the Boer smokes his own growth) was taxed $1 per pound. White flour (the Boer uses coarse meal) was also extortionately taxed. I might continue the list but these are sufficient. In addition to the special tax mentioned above, there was an ad valorem duty of 10 per cent on everything entering the Transvaal republic. When you also take into consideration the enormous cost of transporting the goods into the country, there being at that time no railroad facilities, it will be seen at a glance how the foreigner had to "grunt and sweat under the weary life." Of course, if everyone of the aliens had been rapidly making his pile, there would have been no serious cause for complaint, but the average man there was by no means having an easy time. Wages were very little higher than they are at present in Utah and in many cases it took very skilled domestic financeering to make both ends meet. One item will show clearly the discrimination exercised by the volksraad between the articles consumed by the Uitlanders and those used by the Boers. Tea, which the Boer never uses, was taxed extravagantly, while coffee (of which the Boer is inordinately fond) was free, except for the 10 per cent ad valorem duty.

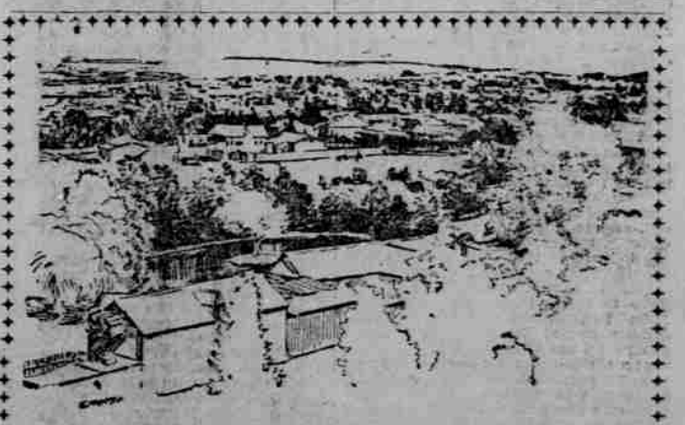
Opposition to Foreigner.

The next step was to make foreign representation impossible or next thing to it. The franchise was raised from four years to fifteen. When, by a persistent habit of living, you had managed to survive Boer legislation for fifteen years, and had existed continuously in the Transvaal for that length of time, you had the privilege of voting. For whom? Why, for a Boer, because no intelligent man could be eligible for office until he had spun out twenty-one consecutive years in the Transvaal.

Don't you think the Boer had done enough to effectually suppress the invader? He didn't. The honorable members of the volksraad, with the combined wisdom of Dogberry and Bottom, discovered that if something were not speedily done to stop the irreverence of the Uitlander, the Almighty, in his wrath, would surely destroy the country. They therefore passed a law that every person caught hunting or fishing on Sundays should be heavily fined for the first offense, and imprisoned for repeating the sacrilegious crime. In their wisdom they also decreed that anyone discovered traveling on Sundays by any mode of conveyance, should be fined or imprisoned at the option of the committing magistrate. The latter law, however, had a saving clause. If the atrocious delinquent could satisfactorily prove that he was going to church, he was entitled to an honorable discharge, provided he had not traveled over twenty miles, that was the limit for Sunday traveling allowed by the legislators. What a poor devotional soul was to do if he lived twenty-one miles from a place of worship was left unexplained. Such laws, are, as a matter of course, more honored in the breach than the observance and even the Dutch magistrates connived at the delinquents, but they go a long way to show what a genuine, native-born Transvaal legislator is.

A Bright Legislator.

Don't you think the honorable members of the volksraad had done



View of the City of Johannesburg, South African Republic.